An Elegant \LaTeX\ Template for Books

Classic Elegant\LaTeX\ Template

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Victory won’t come to us unless we go to it. — M. Moore
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Chapter 1 Elegant\LaTeX \ Templates

On the occasion of this release, we, Elegant\LaTeX Program, want to reintroduce our work to you. We are committed to creating a series of beautiful, elegant, easy to use \LaTeX templates for users. The Elegant\LaTeX is currently composed of ElegantNote, ElegantBook, ElegantPaper for typesetting notes, books, and working papers respectively.

The latest version is available on Github:ElegantBook/releases. This guide describes some settings of this template and how to use it. If you have any other questions, suggestions or comments, please feel free to contact us.

1.1 ElegantBook Updates

Over these years, we’ve received a lot of feedback from users, with major issues related to font installation, coding support, theorem class environments floats, theorem cross-page, cross-references, and etc. We really think about these problems, it wasn’t elegant to let the user install the font for visual beauty since users got into a lot of trouble, which went against the concept of our template. So we’ve removed that from the new version, users don’t have to install any fonts. Let’s take a look at the ElegantBook template 3.x updates:

1. Remove custom font settings and use thectex package or system font instead;
2. Add English and Chinese modes (lang=cn/en);
3. \texttt{PDFLaTeX} \& \texttt{XeLaTeX} Support;
4. Use the \texttt{tcolorbox} package to re-written the theorem class environments, which can span over pages;
5. Theorem class environments name updated, and cross-references fixed;
6. Color name updated, link color unified;
7. New Elegant\LaTeX Logo;
8. New cover and decorations, remove the watermark;
9. Fix appendix;
10. Add gray theme: \texttt{color=plain};
11. Add code highlighting;
12. Beautify the list environment.
Chapter 2  ElegantBook Settings

2.1 Compilation Methods

This template is based on the Standard LaTeX book class, so the options of book class also work. The default encoding is UTF-8, and \TeX Live is recommended. The test environment is Win10 + \TeX Live 2018.

2.1.1 Compile with PDFLaTeX

If you choose PDFLaTeX to process your book, the default article font computer modern has changed to newtx series, and the default font size is set to 11pt. The fonts are settings with:

- newtxtex package for text fonts, similar to times new roman font.
- newtxmath package for math fonts, close to times package.
- FiraMono package for typewriter fonts, with option scale=0.7.
- ctex package for Chinese fonts, with option scheme=plain.

A full compilation chain: PDFLaTeX -> BibTeX -> PDFLaTeX*2.

2.1.2 Compile with XeLaTeX

If you choose XeLaTeX to process your book, we use fontspec package and xeCJK package. we used fonts available in Windows, if you are using Linux or Mac OS, please substitute these fonts with that of your system.

\begin{verbatim}
\RequirePackage{fontenc}
\RequirePackage[no-math]{fontspec}
\setmainfont{Times New Roman}[NFSSFamily=ntxtlf]
\setsansfont{Arial}
\setmonofont{Courier New}
\RequirePackage{xeCJK}
\RequirePackage{xunicode}
\setCJKmainfont[BoldFont={SimHei},ItalicFont={KaiTi}]{SimSun}
\setCJKsansfont[BoldFont={SimHei},ItalicFont={KaiTi}]{KaiTi}
\setCJKmonofont[BoldFont={SimHei},ItalicFont={KaiTi},Scale=0.7]{Microsoft YaHei}
\end{verbatim}
2.2 Languages

We defined one option named \texttt{lang}, this option has two alternative values, \texttt{lang=en} (default) or \texttt{lang=cn}. \texttt{lang=cn} will make the caption of figure/table, abstract name, refname etc. Chinese, while \texttt{lang=en} will keep all these stuff English, as the default article class sets. You can use this option as

\begin{verbatim}
\documentclass[en]{elegantbook}
\documentclass[lang=en]{elegantbook}
\documentclass[lang=cn]{elegantbook}
\documentclass[lang=cn]{elegantbook}
\end{verbatim}

\textbf{Remark:} You can input Chinese Character in either \texttt{lang=en} or \texttt{lang=cn}. If you are using (\texttt{lstlisting}) environment, and it contains Chinese characters, please use \texttt{XeLaTeX}.

2.3 Color Themes

This template contains 4 color themes, they are \texttt{green} (default), \texttt{cyan}, \texttt{blue}, \texttt{plain}, and there is a customization color option \texttt{nocolor}. You can choose \texttt{green} with

\begin{verbatim}
\documentclass[green]{elegantbook} %or
\documentclass[color=green]{elegantbook}
\end{verbatim}

where \texttt{plain} theme is gray for all theorem class environments and paper structures. If you want to customize the colors, please select \texttt{nocolor} or use \texttt{color=none}, then define the main, second, and third colors in the preamble section as follows:

\begin{verbatim}
\definecolor{main}{RGB}{70,70,70}
\definecolor{second}{RGB}{115,45,2}
\definecolor{third}{RGB}{0,80,80}
\end{verbatim}

2.4 Chapter Title Display Styles

This template contains 2 sets of \textit{title display styles}, which including \texttt{hang} (default) and \texttt{display} style.
2.5 Theorem Class Environments

In this template, we defined four categories of theorem class environments:

- **Theorem Environment**, including title and contents, numbering within chapter.
  - Three types depending on the format:
    - *definition* environment, the color is main;
    - *theorem, lemma, corollary* environment, the color is second;
    - *proposition* environment, the color is third.
- **Example Environments**, including *example, exercise, problem* environment, auto numbering within chapter.
- **Proof Environment**, including *proof, note* environment, they contain introductory symbol (*note* environment) or ending symbol (*proof* environment).
- **Conclusion Environments**, including *conclusion, assumption, property, remark, solution* environment, all of these begin with boldfaced words, and the contents are the same as a normal paragraph.

2.5.1 Theorem Class Environments

The template uses the `tcolorbox` package to customize the theorem class environments, it is slightly different from the normal theorem environments. The usage is as follows:

```latex
\begin{theorem}{<theorem name>}{<label>}
The content of theorem.
\end{theorem}
```
The first parameter \texttt{<theorem name>} is the name of the theorem, and the second parameter \texttt{label} is the label used in cross-reference with \texttt{ref{thm:label}}. Note that cross-references must be prefixed with \texttt{thm:}. The effect is as follows:

\textbf{Theorem 2.1: <theorem name>}

\textit{The content of theorem.}

Other theorem class environments with the same usage are:

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|l|}
\hline
Environment & Label text & Prefix & Cross-reference \\
\hline
definition & label & def & \texttt{ref{def:label}} \\
theorem & label & thm & \texttt{ref{thm:label}} \\
lemma & label & lem & \texttt{ref{lem:label}} \\
 corollary & label & cor & \texttt{ref{cor:label}} \\
proposition & label & pro & \texttt{ref{pro:label}} \\
\hline
\end{tabular}
\caption{Theorem Class Environments}
\end{table}

2.5.2 Other Customized Environments

The other three math environments can be used directly since there are no options for them, the \texttt{example} environment usage:

\begin{verbatim}
\begin{example}
This is the content of example environment.
\end{example}
\end{verbatim}

The effect is as follows:

\textbf{Example 2.1:} This is the content of example environment.

These are all the same environments, except that

- example, exercise, problem environments numbering within chapter;
- note with introductory symbol, proof with ending symbol;
- conclusion environment with boldfaced keywords and normal paragraph content.

2.6 Cover and Logo

The cover image used in this template is from pixabay.com. The image is completely free and can be used in any circumstance. The cover image size is 1280 \times 1024, when changing the cover, please crop it according to the size of the cover picture strictly. Here is a free online image clipping site: befunky.com.

\footnote{Thank China\TeX for providing free image source site, and pexels.com is also recommended.}
2.7 List Environments

This template uses \texttt{tikz} to customize \texttt{itemize} and \texttt{enumerate} environments, the \texttt{itemize} environment customized to the third depth, and \texttt{enumerate} environment customized to fourth depth. The effect is as follows

- first item of nesti;
- second item of nesti;
  - first item of nestii;
  - second item of nestii;
  - first item of nestiii;
  - second item of nestiii.

- first item of nesti;
- second item of nesti;
  - first item of nestii;
  - second item of nestii;
  - first item of nestiii;
  - second item of nestiii.

2.8 Bibliography

This template uses Bib\TeX to generate the bibliography, the default bibliography style is \texttt{aer}. Let’s take a glance at the citation effect, Chen et al. (2018) use data from a major peer-to-peer lending marketplace in China to study whether female and male investors evaluate loan performance differently.

If you want to use Bib\TeX, you must create a file named \texttt{reference.bib}, and add bib items (from Google Scholar, Mendeley, EndNote, and etc.) to \texttt{reference.bib} file, and cite the bibkey in the \texttt{tex} file. The Bib\TeX will automatically generate the bibliography for you for the reference you cited. If you want to add some noncited reference to the bibliography, you can use

\texttt{\nocite{EINAV/two.tosf/zero.tosf/one.tosf/zero.tosf, Havrylchyk/two.tosf/zero.tosf/one.tosf/eight.tosf}}

2.9 Preface

If you want to add a preface before the first chapter without changing the number of chapter, you can use it before the first chapter

\texttt{\chapter*{Preface}}

\texttt{\addcontentsline{toc}{chapter}{Preface}}

\texttt{\markboth{Preface}{}}

The content of Preface.
Chapter 3  ElegantBook Writing Sample


3.1 Writing Sample

We will define the integral of a measurable function in three steps. First, we define the integral of a nonnegative simple function. Let $E$ be the measurable set in $\mathbb{R}^N$.

**Definition 3.1: Left Coset**

Let $H$ be a subgroup of a group $G$. A left coset of $H$ in $G$ is a subset of $G$ that is of the form $xH$, where $x \in G$ and $xH = \{xh : h \in H\}$. Similarly a right coset of $H$ in $G$ is a subset of $G$ that is of the form $Hx$, where $Hx = \{hx : h \in H\}$.

**Note:** Note that a subgroup $H$ of a group $G$ is itself a left coset of $H$ in $G$.


**Theorem 3.1: Lagrange’s Theorem**

Let $G$ be a finite group, and let $H$ be a subgroup of $G$. Then the order of $H$ divides the order of $G$. 

**Proposition 3.1: Size of Left Coset**

Let $H$ be a finite subgroup of a group $G$. Then each left coset of $H$ in $G$ has the same number of elements as $H$.

**Proof:** Let $z$ be some element of $xH \cap yH$. Then $z = xa$ for some $a \in H$, and $z = yb$ for some $b \in H$. If $h$ is any element of $H$ then $ah \in H$ and $a^{-1}h \in H$, since $H$ is a subgroup of $G$. But $zh = x(ah)$ and $xh = z(a^{-1}h)$ for all $h \in H$. Therefore $zH \subset xH$ and $xH \subset zH$, and thus $xH = zH$. Similarly $yH = zH$, and thus $xH = yH$, as required. □

Regression analysis is a powerful statistical method that allows you to examine the relationship between two or more variables of interest. While there are many types of regression analysis, at their core they all examine the influence of one or more independent variables on a dependent variable. The process of performing a regression allows you to confidently determine which factors matter most, which factors can be ignored, and how these factors influence each other.

Let’s continue using our application training example. In this case, we’d want to measure the historical levels of satisfaction with the events from the past three years or so, as well as any information possible in regards to the independent variables.
### Table 3.1: Auto MPG and Price

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mpg</td>
<td>-238.90***</td>
<td>-49.51</td>
</tr>
<tr>
<td></td>
<td>(53.08)</td>
<td>(86.16)</td>
</tr>
<tr>
<td>weight</td>
<td>1.75***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.641)</td>
<td></td>
</tr>
<tr>
<td>constant</td>
<td>11.253***</td>
<td>1,946</td>
</tr>
<tr>
<td></td>
<td>(1.171)</td>
<td>(3,597)</td>
</tr>
<tr>
<td>obs</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.220</td>
<td>0.293</td>
</tr>
</tbody>
</table>

Standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$


- Routing and resource discovery;
  - Language Models
  - Vector Space Models
- Resilient and scalable computer networks;
- Distributed storage and search.


Appendix  Mathematical Tools

This appendix covers some of the basic mathematics used in econometrics. We briefly discuss the properties of summation operators, study the properties of linear and some nonlinear equations, and review the ratios and percentages. We also introduce some special functions that are common in econometrics applications, including quadratic functions and natural logarithms. The first four sections require only basic algebraic techniques. The fifth section briefly reviews differential Calculus Although Calculus is not necessary to understand much of this book, it is used in some of the end-of-chapter appendices and in some of the more advanced topics in part 3.

A.1 Summation Operator and Description Statistics

**Summation Operator** is an abbreviation used to express the summation of numbers, it plays an important role in statistics and econometrics analysis. If \( \{x_i : i = 1, 2, \ldots, n\} \) is a sequence of \( n \) numbers, the summation of the \( n \) numbers is:

\[
\sum_{i=1}^{n} x_i \equiv x_1 + x_2 + \cdots + x_n \quad (A.1)
\]
Appendix  A Minimal Example

\documentclass{elegantbook}
% title info
\title{Title}
\subtitle{Subtitle is here}
% bio info
\author{Your Name}
\institute{XXX University}
\date{\today}
% extra info
\version{1.00}
\equote{Victory won’t come to us unless we go to it. --- M. Moore}
\logo{logo.png}
\cover{cover.jpg}

\begin{document}
\maketitle
\tableofcontents
\mainmatter
\hypersetup{pageanchor=true}
% add preface chapter here if needed
\chapter{Example Chapter Title}
The content of chapter one.
\bibliography{reference}

\appendix
\chapter{Appendix Chapter Title}
The content of appendix one.